ABSTRACT

A method and apparatus are provided a method and apparatus for reducing a program that preserves branching time properties, including existential and universal aspects. An alternating transition system (ATS) is abstracted, formed by a product of a program, M, with an alternating tree automaton, A, for a property, f. The disclosed program abstraction method generates the abstract program and an altered version of the branching time property, f. An automated program check, such as a model check, is performed on the abstract program for the altered branching time property. The invention provides semantic completeness: i.e., whenever a program satisfies a property, this can be shown using a finite-state abstract ATS produced by the method. Choice predicates can be employed to help resolve nondeterminism at OR states, and rank functions can be employed to help preserve progress properties.

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